

Research Methodology

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- Except in rare cases, a doctoral candidate has to choose one guide
- The research guide is variously called
 - doctoral advisor
 - dissertation advisor
 - doctoral supervisor
- In some cases, more than one guide may team up to supervise a doctoral student

Role of a Guide

- Help selection of coursework
- Facilitate research
- Provide continued guidance throughout the research life cycle
- Shape, refine and readjust the topic and extent of research as it evolves
- Be a member of the research advisory committee for the student
- Would tentatively decide whether the research is good enough for Ph.D

Institutional Ph.D Research committee

- Institutional PhD research committee also provides guidance at a broader level. The committee may meet infrequently, say twice a year
- In some universities, only a full professor is allowed to chair the PhD research committee. In case the guide is not a full professor, the PhD research committee may be chaired by the HOD or a senior and experienced professor

Window Shopping for a Supervisor

You have already crossed this path.

However, following are the steps generally.

- In this phase, the aspirant is looking for a prospective supervisor, without making a firm commitment
- The first task is to prepare a short prioritized list of prospective supervisors
University website and Professors home pages would be useful for this
- The first few of this list should be further researched

Window Shopping for a Supervisor Contd.

- While researching about a prospective supervisor the candidate should try to figure out whether the prospect
 - 1 Is an expert in the area of interest
 - 2 Has the time; Not already overloaded
 - 3 Has reputation of high intellectual ability and integrity
 - 4 Has good track record
 - 1 Past PhD scholars
 - 2 Publications
 - 5 Has funding, where applicable

Window Shopping for a Supervisor Contd.

- Having short listed prospective supervisors comes the crucial question;

Why would the supervisor agree to supervise YOU?

- A supervisor would accept a PhD student if
 - ① the supervisor is not already overloaded and
 - ② the aspirant can convince that the candidate
 - ① Has adequate and clear research motivation
 - ② Has adequate background in the areas where the supervisor is currently working
 - ③ Can articulate findings in the form of a report/ paper
 - ④ Is recommended by a teacher



Students as a Resource

- Supervisor-Student relationship is a two way long term relationship
- Supervisor will guide you in your Ph.D journey by redefining the problem, evaluating the technical details, refining the draft etc.
- Supervisor also can help you to overcome the stress which is very common in this journey
- In some institute (example IITs), the recommendation from Ph.D supervisor is madatory

Students as a Resource Contd.

- On the other hand, students are the resources for generating research papers for the supervisor
- So there might be some temptation to be overloaded with students
- However, the commitment to be a supervisor includes the responsibility for completion of a successful Ph.D of a student
- So supervisor needs to be careful before any commitment

Marriage vs. Ph.D

MARRIAGE vs. The Ph.D.		
		
	<u>Marriage</u>	<u>Ph.D.</u>
Typical Length:	7.5 years	7 years
Begins with:	A proposal	A thesis proposal
Culminates in a ceremony where you walk down an aisle dressed in a gown:	✓	✓
Usually entered into by:	Foolish young people in love	Foolish young people without a job
50% end in:	Bitter divorce	Bitter remorse
Involves exchange of:	Vows	Know-how
Until death do you part?	If you're lucky	If you're lazy

3/25/06, Chaitin © 2010

WWW.PHDCOMICS.COM

Figure: Marriage vs. Ph.D

Ref: Research Methodology, Prof. T. K. Ghosal, Jadavpur University, 2013

Ph.D Proposal

- Many institutes require that a formal proposal for PhD research be attached to the application for admission (**This is not applicable for TCG CREST**)
- However, it may require if you apply abroad or for post doctoral application after Ph.D
- The Ph.D proposal in S&T typically contains
 - Statement of the research problem
 - A background of the problem (earlier work and why the proposed area is of current interest)
 - Elaboration of research problem
 - Proposed approach and Methodology
 - Facilities required
 - A rough time line (optional).

Stating The Research Problem

- So far the aspirant has probably selected only a broad research area.
- A further narrowing down and refining the problem are required.
- Having an experienced supervisor makes the above step easy; s/he may prescribe one.
- Often the supervisor would suggest only a tentative “Title”.
- The title should have some descriptive aspect but should not be too restrictive; giving the student some flexibility.
- For example, “Study in the field of Quantum Cryptography” etc.

Stating The Research Problem Contd.

- In this phase the candidate should not worry too much about the wording—the title may be changed later.
- Unless it is a sponsored project, where more careful wording must be done at the beginning
- For the ‘tentative title’
 - aspirant needs a preliminary literature search
 - needs discussion with the guide
 - initiates discussions with other more experienced members of the team (if there is any)
 - refine and elaborate the scope of the research

Ways to Find A Research Problem

- Starting from a few recent publications in the area of interest, the aspirant should ponder about the following types of questions
 - Can I refine/improve a definition?
 - Can I improve the theory?
 - Can I improve the experiment?
 - Can I broaden the circumstances in which the effect occurs?
 - Can I simulate this on the computer?
 - Can I improve the statistical analysis?

Ways to Find A Research Problem Contd.

- Stated otherwise, the aspirant would try to
 - Find a gap in existing knowledge
 - Find an exception to generally accepted laws/rules/concepts
 - Hybridize two existing theories/approaches
- The above is easier said than done.
- Nevertheless the aspirant must go through this difficult phase.
- Any effort put into this exercise would provide rich dividend later.
- Only after the guide gets convinced that you have done the “due diligence” and prepared a draft proposal, the guide would come to your rescue.

Utility of A Research Problem

- The first utility of research proposal is
 - Sensitizing the aspirant about the problem during its preparation.
- The research proposal, however, would have to be used and reused often throughout the research life cycle with various revisions and augmentation.
- At any given point of time the proposal is the road map for the aspirant.
- It should be a constant companion, to be regularly perused and analysed to generate action points.
- During discussions with the guide, a hard copy of the proposal should be kept handy.

More about Research Problem

- As the aspirant progresses along the research path, the research proposal would be refined, detailed and redrafted.
- The “approach and methodology” section, which was rather sketchy at the beginning will gradually take a more concrete shape.
- At the end of approximately one year the aspirant may append the following sections (which also would undergo frequent revisions) to the proposal:
 - Tentative time line
 - Thesis outline (Chapter names)
 - Tentative conclusions

Let's Have Some Fun

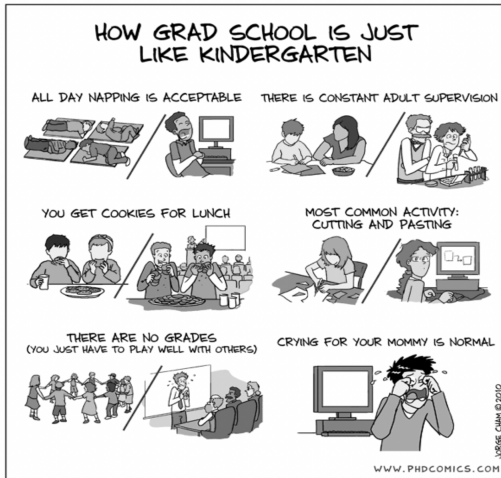


Figure: Kindergarten vs. Grad School

Student and Guide

What We Will Discuss Here?

- The importance of student–supervisor relationships
- Roles and responsibilities of supervisors and students
- The developing nature of supervision
- Keeping in touch with a supervisor
- Handling dissatisfaction with supervision
- Supervision by a team

The importance of student–supervisor relationships

- The relationship between a research student and a supervisor is an important element towards success of the PhD project.
- Maintaining a cordial professional relationship is the minimum requirement.
- Students should strive to develop and nurture this relationship.
- Only highly unusual students successfully complete their research degrees if relationships with their supervisors are poor.
- The relationship will last for several years during the tenure of the project.
- Most often much beyond that.

The importance of student–supervisor relationships Contd.

- A research degree is about research training as well.
- The training is facilitated by a close professional relationship.
- There are two aspects of the relationship:
 - 1 Formal and administrative; with defined roles of students and supervisors
 - 2 interpersonal; which takes into account that both parties are human beings

Student–supervisor relationships is special

- The student–supervisor relationship is unique, often based on a mix of informal and formal aspects.
- The relationship between a PhD research student and her/his supervisor(s) is very different to that between the student and course instructor.
- The former is a long term relationship.
- The PhD student is more of an apprentice than a tutee.

Roles and responsibilities of supervisors

- Facilitation
 - Pre-registration
 - During settling down
 - Mid-course help
 - During the final phase
 - Training in required research skills
- Provide continued guidance and academic support

Pre Registration Facilitation

- Help selecting/motivating students who are appropriately qualified and have research potential
- Help selecting topic
- Suggest alternative (more suitable) or additional guides
- Ensuring that the supervisory team has the expertise to supervise in the candidate's area of study
- Advise funding possibilities
- Sensitize the students regarding University Ph D rules and expected role of a PhD student
- Help framing the research proposal
- Getting the application processed by the University, i.e., by the Doctoral Committee

Facilitation During Setling Down

- Introduces with the co-students
- Helps to obtain laboratory facilities
- Convenes or chair the research advisory committee.
- Helps selection of coursework
- Advises to set up a time table
- May give some training assignments.
- Advises preferred modes of interaction
- Informs regarding availability of supervisor
 - Frequency
 - Preferred days and time

Mid Course Facilitation

- Facilitating resources and advising for literature survey.
- Shape, refine and readjust the topic and extent of research as it evolves.
- Assisting to keep the research on track
- Assisting to overcome academic problems associated with the research.
- Regularly review the progress of research and plan.
- Giving constructive feedback on the work in progress
- Fixing a schedule for students to produce written work on a regular basis and motivating them to stick to it
- Advising about framing research papers and preferred modes of communication.
- Reviewing manuscripts of papers to be communicated.

Mid Course Facilitation Contd.

- Advise regarding further actions and framing responses to reviewer's comments on communicated papers.
- Assisting students to prepare for formal progress reviews
- Reporting formally on their progress at specified intervals to appropriate bodies.
- Ensuring availability of adequate resources to support the research project and reviewing this regularly.
- Maintaining a professional relationship with the student and also with others in the supervisory team or advisory committee.
- Making alternative supervision in the event of long absence

Facilitation at the Final Phase

- Assistance in planning to complete the thesis
- Advising about the preferred organization and format of the thesis.
- Reviewing the thesis.
- Sensitize about the submission rules
- Assists to extend the registration, if required
- Advising students to acquire the skills which will help them to advance careers, either inside or outside academia.

Facilitation at the Final Phase Contd.

- Advising the doctoral committee on the choice of examiners
- Assisting the student with preparation for oral examination where applicable
- Arranging the thesis examination and the oral examination where appropriate
- In many countries, the supervisor himself is acting as an examiner
- In cases where thesis is referred for further work, assisting students to complete it within an institutionally defined time period

- In the absence of formal training, the supervisor has to facilitate some remedial measures :
 - 1 Recommending course work in advanced topics
 - 2 A research methodology course with strong emphasis on assignment and group work
 - 3 Arranging regular and periodic colloquium/ seminar
 - 4 Supervised/evaluated Term papers.
 - 5 Recommending to work in a big research group (peer level training)

- Additional Facilitation
 - Deputing students to short courses and training programmes on required skills, examples;
 - ① Creative writing
 - ② Critical thinking
 - ③ Appropriate Software
- Facilitate Student initiated learning by recommending books and other resources

- Research Methodology, Prof. T. K. Ghosal, Jadavpur University, 2013

In the next class we will discuss about the
Roles and Responsibilities of Students